

Method of Manufacture of FinFET Devices with T-Shaped Fins and Devices Manufactured Thereby

An FET device comprises a semiconductor structure with a source island, a drain island over a horizontal surface of a substrate comprising an insulating material. A channel structure over the horizontal surface of the substrate connects between the drain and the source, with the channel structure comprising a horizontal semiconductor channel fin above a vertical fin with the planar fin and the vertical fin having a T-shaped cross-section. The vertical fin is contact with the horizontal surface of the substrate and the planar fin is in contact with the top of the vertical fin. A gate dielectric layer covers exposed surfaces of the channel structure. A gate electrode straddles the channel gate dielectric and the channel structure. Then a sacrificial layer such as SiGe is deposited upon the substrate before forming the vertical fin which may be either a semiconductor or dielectric material. The planar fin is a semiconductor material such as Si, SiGe or Ge.